

REMARKS

Claims 43-77 are pending in the application. Claims 43, 45-48, 55, 64, 72 and 75-77 are amended with this paper, and new Claims 78-81 are submitted. No new matter is added by the amendments to either the claims or the specification. Nor is any matter added with the addition of new claims 78-81.

Objection to the Specification

The specification has been amended on paragraph 0006 at page 2, line 23 to correct a typographical error referencing the patent number of Rodriguez et al.

The specification has also been amended in paragraphs 0001 and 0009 to update the status of the co-pending application. Accordingly, with these amendments, Applicants respectfully request that the objection be withdrawn.

Non-Statutory Obviousness-Type Double Patenting Rejections

Claims 43-54 and 64-77 were rejected on the ground of non-statutory obviousness-type double patenting as allegedly unpatentable over claims 1-30 of US Patent No. 6,672,077. While not agreeing with the propriety of the this rejection, Applicants, with the intent of moving the claims toward allowance, have submitted here with a terminal disclaimer. Accordingly, Applicants respectfully request that the rejections be withdrawn.

Rejections Under 35 U.S.C. § 102(b) and/or 103(a)

Claims 43-47, 64-65 and 67-71 were rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over US Patent No. 5,653,951 to Rodriguez et al. (the "Rodriguez reference").

Claims 43, 55 and 64 have each been amended to delete the phrase "substantially greater than 0.10 eV" and to substitute the limitation "of at least about 0.13 eV".

The limitation of these amendments are supported by the Specification, which describes a series of exemplary embodiments which are each clearly distinguishable and nonobvious with respect to the Rodriguez 5,653,951 reference, and all of which provide binding energies of at least about 0.13 eV. These are listed below, and for each example is shown the binding energy, the corresponding abbreviation from the description, and the Figure and paragraph citations:

<u>Binding energy EB</u>	<u>Abbreviation</u>	<u>Figures</u>	<u>Description</u>
about 0.13 eV	(BN, planar)	Figs. 4A,B;	¶¶ 0051-52.
about 0.14 eV	(C, boron defect)	Figs. 8A,B;	¶¶ 0066-67.
about 0.14 eV	(C, 6-atom-vacancy)	Fig. 9B;	¶ 0077.
about 0.14 eV	(C, 5-7-7-5 defect)	Figs. 10A,B;	¶¶ 0079-80.
about 0.15 eV	(C, charged)	Figs. 11A,B;	¶¶ 0084-85.
about 0.20 eV	(BN, carbon impurity)	Fig. 8C;	¶ 0069.
about 0.26 eV	(CN, planar)	Figs. 4C,D;	¶¶ 0054-55.

Applicants respectfully submit that these amendments overcome the basis of the rejections relating to the Rodriguez reference. Applicants request that the rejections be withdrawn.

Rejections Under §112, second paragraph

Claims 43-77 were rejected under 35 U.S.C. § 112, second paragraph as allegedly indefinite for failing to particularly point out and distinctly claim the subject matter of the invention. While not agreeing with the propriety of the rejection, Applicants have amended claims 43, 48, 55 and 64 to delete the phrase "substantially greater than 0.10 eV" and to substitute the phrase "of at least about 0.13 eV". Support is provided in the Specification as shown above.

Additionally, claims 45-47 have been amended to clarify a distinction between planar and non-planar nanostructures. Support is provided in the Specification at paragraphs 0050, 0052-53, and 0055-56 (pages 8-10).

Claim 72 has been amended to delete the term "substantial" and to define the relative "portion of molecular lattice defects" in terms of effecting an increase in binding energy (relative to defect-free) sufficient to result in a binding energy to adsorbed hydrogen of at least about 0.13 eV. Support is provided in the Specification at Figs. 10A,B; paragraphs 0079-80.

Claims 75-76 have been amended to correct the form of the Markush groups, with no change in underlying subject matter.

With respect to the rejection related to "description support" for the limitation "substantially greater than 0.10 eV", claims 43, 55 and 64 have each been amended to replace the phrase "substantially greater than 0.10 eV" with the phrase "of at least about 0.13 eV". Support for this amendment is found throughout the Specification as indicated in the table above.

Applicants respectfully submit that these amendments remove any grounds for the rejections per §112, second paragraph, and request that the rejections be withdrawn.

Rejections Under 35 U.S.C. §112, first paragraph

Claims 43-77 were rejected as allegedly failing to comply with the written description requirement. In particular, the Office contends that the application lacks written description for "nanostructures being in such forms as nanoplatelets, nanotubes, nanofibers, nanorods and nanowires." Applicants respectfully disagree with this rejection. Indeed, Applicants note that the cited limitations were, prior to the current amendments, recited in whole or part in independent Claims 43, 48, 55 and 64, which claims were added by the Amendments filed on April 25, 2005 (canceling original claims 1-42).

Moreover, Applicants note the following MPEP passages for determining "possession of the claimed invention" with respect to new or amended claims:

- MPEP 2163, part I provides: "An applicant shows possession of the claimed invention by describing the

claimed invention with all of its limitations using such descriptive means as words, structures, figures, diagrams, and formulas that fully set forth the claimed invention. *Lockwood v. American Airlines, Inc.*, 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1966 (Fed. Cir. 1997)."

- MPEP 2163, part I(B) provides: "New or amended claims which introduce elements or limitations which are not supported by the as-filed disclosure violate the written description requirement. *See, e.g., In re Lukach*, 442 F.2d 967, 169 USPQ 795 (CCPA 1971); *In re Smith*, 458 F.2d 1389, 1395, 173 USPQ 679, 683 (CCPA 1972)."

With this paper, claims 43, 48, 55 and 64 have been amended to delete the Markush groups previously reciting particular forms of nanostructures. New dependent Claims 78-81 have been added (depending from claims 43, 48, 55 and 64 respectively). In each new claim, there is a Markush group that recites the particular forms of nanostructures which were deleted from the respective independent claims.

Descriptive support for the forms of nanostructures recited in new claims 78-81 may be found throughout the Specification, at, for example, the following passages:

- nanoplatelets - Figs. 4A-D, paragraphs 0051-56, and particularly paragraph 0055 (page 9), which describe, among other things, planar boron nitride and carbon nitride material, as well as nanoplatelets.
- nanotubes - Figs. 7A-B, paragraphs 0063-64 (page 11), and 0088 (page 17), which describe, among other things, boron nitride nanotubes.
- nanofibers, nanorods, nanowires - paragraphs 0063-64, which describe, among other things, nanofibers, nanorods, and nanowires.
- nanocages, buckyballs - Figs. 5A-B and 6, paragraphs 0059-62 and particularly paragraph 0059 (page 10), which describe, among other things, boron nitride nanotubes nanocages and "buckyballs.
- nanococoons, nanotorii, nanocoils, and nanohorns - paragraph 59, which describes nanococoons, nanotorii, nanocoils, and nanohorns as well as a number of other forms.

Each of these citations to the Specification describe, illustrate and define the exemplary forms and embodiments of the invention, and provide structures, figures, and formulas for the same. Applicant submits that these portions of the Specification and Drawings provide adequate "description support" within the meaning of §112 for the particular nanostructures recited in the claims. Accordingly, Applicants respectfully request that the rejections pursuant to §112, first and paragraph be withdrawn.

Conclusion

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested. If any issues remain, please contact Applicant's undersigned representative at (949) 760-9600. The Commissioner is hereby authorized to charge any additional fees that may be required to Deposit Account No. 50-2862.

Respectfully submitted,
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By: _____

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